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Fresh-water Halacarid Mites from Oahu Island, Hawaii*

With 5 Text-figures

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ABSTRACT The following two subspecies of halacarid mites from streams in Oahu Island are described and illustrated:

Lobohalacarus weberi weberi (ROMIJN et K. VIETS, 1924)

Soldanellonyx monardi monardi WALTER, 1919

These are the first record of fresh-water halacarids from the Hawaiian Islands.

In Hawaii, only two reports have hitherto been made on the marine halacarid mites of Oahu Islands. One of them is by NEWELL (1956), who recorded *Copidognathus matthewsi* parasitic on the marine crustacean, *Parribacus antarcticus*; the other is by BARTSCH (1979), who described four species of halacarids from intertidal sandy beach: *Actacarus pacificus* BARTSCH, *Copidognathus* sp., *Acarochelopodia* sp. and *Scaptognathides* sp.

During October and November of 1971, I made a surveying trip for water mites (Halacaridae and Hydrachnellae) to the Hawaiian Islands. I was able to collect only halacarid mites from the fresh-water, no hydrachnellid mites being included in my collection. It seems to me that the mites of the latter group have not invaded to any island of the Hawaiis. I will later report on marine halacarid and hydrachnellid mites which were collected on that occasion from Oahu Island and Hawaii Island. In this paper, I will deal only with the fresh-water halacarid mites collected from streams in Oahu Island as listed below, giving the descriptions later:

Porohalacarinae

Lobohalacarus weberi weberi (ROMIJN et K. VIETS, 1924)

Limnohalacarinae

Soldanellonyx monardi monardi WALTER, 1919

Lobohalacarus weberi weberi (ROMIJN et K. VIETS, 1924)

(Figs. 1–2)

Male. Body almost of spindle shape, 340 μ in length, including an anterior

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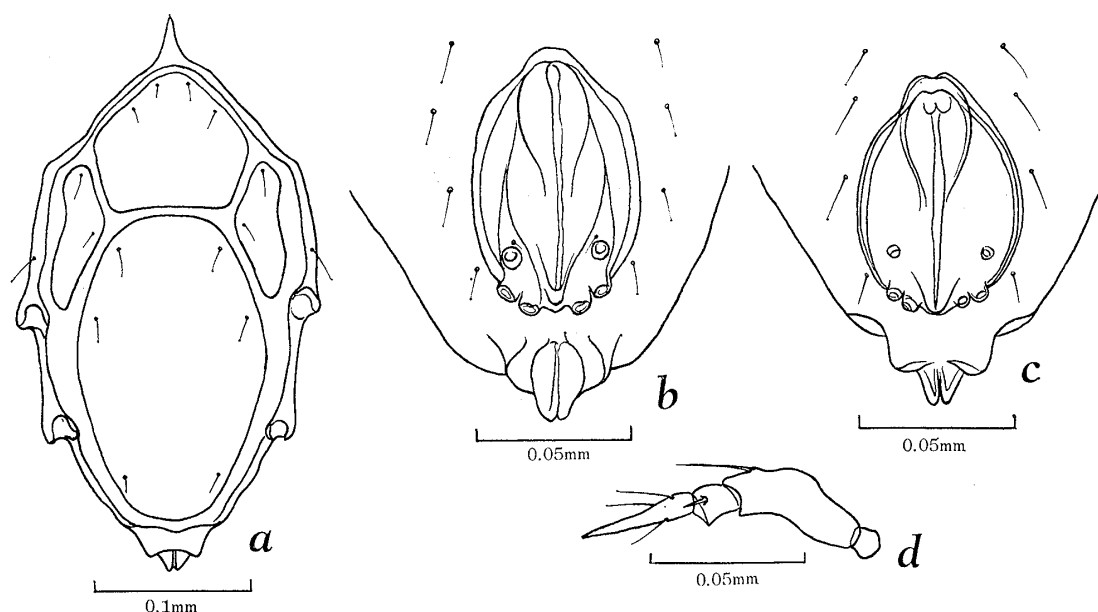


Fig. 1. *Lobohalacarus weberi weberi* (ROMIJN et K. VIETS). — a, Dorsum, male; b, genital area, male; c, genital area, female; d, palp, male.

conical process and an anal hump, and $180\ \mu$ in width. Eyes absent. Antero-dorsal plate pentagonal, with four fine hairs, $78\ \mu$ in length and $96\ \mu$ in width. Postero-dorsal plate elliptical in shape, with three pair of minute hairs, $192\ \mu$ in length and $117\ \mu$ in width. Latero-dorsal plates each with two minute hairs, $84\ \mu$ in length and $35\ \mu$ in width. Maxillary organ $90\ \mu$ in length. Palps as shown in Fig. 1 d. P-II a little curved dorsally and with one long spine. P-III with a thick but short spine on inner surface. P-IV with three hairs. Palpal segments measured as shown in Table 1 (in μ). Chelicerae $108\ \mu$ in length, each including a claw, and $20\ \mu$ in height. Legs as shown in Fig. 2 a-d. L-I with no feathered spine. L-II and L-IV each with two feathered spines on fifth segment. L-III with one feathered spine on fifth segment. Length of legs measured in μ : L-I, 260; L-II, 208; L-III, 240; L-IV, 240. Gonopore large, elliptical and with three shortly stalked acetabulae on each lip as shown in Fig. 1 b. Excretory pore terminal in posterior.

Table 1

| Palpal segments | I | II | III | IV |
|------------------|----|----|-----|----|
| Extensor surface | 12 | 42 | 9 | 36 |
| Height | 10 | 15 | 10 | 6 |

Female. Body shape and organs all resemble those of the male. Body $330\ \mu$ in length, including an anterior conical process and an anal hump, and $174\ \mu$ in width.

Nymphs. Body shape and organs almost similar to those of the adults, except

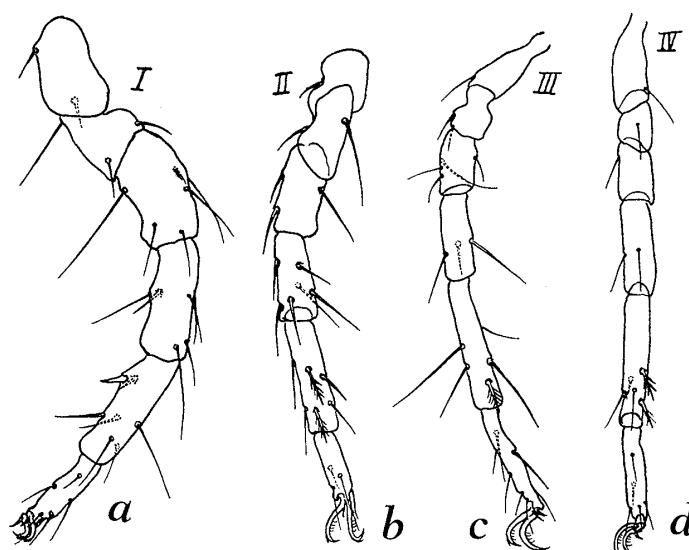


Fig. 2. *Lobohalacarus weberi weberi* (ROMIJN et K. VIETS), male; a-d, I-IV legs.

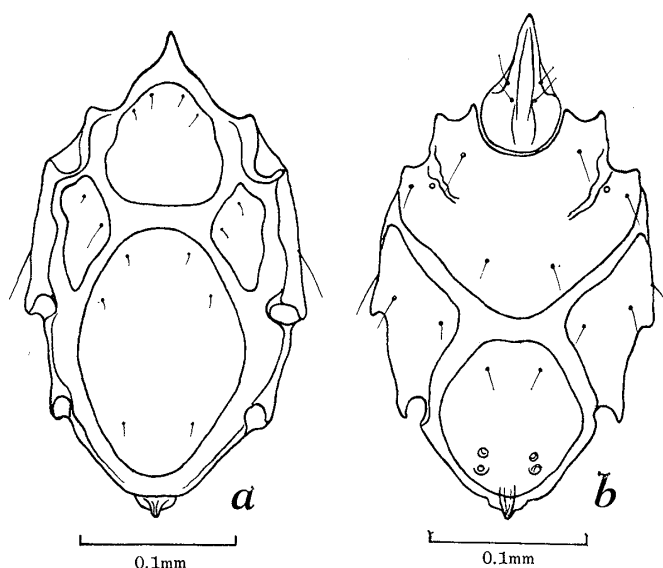


Fig. 3. *Lobohalacarus weberi weberi* (ROMIJN et K. VIETS), deutonymph; a, dorsum; b, venter.

for genital plate. Genital plate with four acetabulae in deutonymph (Fig. 3 a-b) and two acetabulae in protonymph. Dorsal shields and epimeral shields with scale-like appearance. Fourth legs of protonymph five-segmented.

Localities. Eight males, five females, fourteen deutonymphs and four protonymphs were collected by the author on Oct. 5, 1971 among submerged tree roots and dead leaves in the Waimea Stream and also some adults and nymphs among dead leaves in pools in the Moleka Stream, Tantalus Hill, Honolulu, together with the following subspecies *Soldanellonyx monardi monardi*.

Remarks. This subspecies seems to be widely distributed in Europe, Africa and Hawaii, living in small streams, pools, marshes and sphagnum moors. Stygobiontic form should belong to another subspecies as was written by K. VIETS (1937).

Soldanellonyx monardi monardi WALTER, 1919

(Figs. 3–5)

Female. Body oval in contour, 336 μ in length and 220 μ in width, excluding rostrum. Eyes vestigial, but with small pigment grains. Antero-dorsal shield almost quadrate, 98 μ in length and 92 μ in width, having one pair of small hairs near anterior margin. Postero-dorsal shield oval in shape, 196 μ in length and 112 μ in width. Ocular plates each measured 58 μ in length and 48 μ in width. Maxillary organ 108 μ in length and 93 μ in height. Figure 4 c illustrates the proportions and chaetotaxy of the palp. Palps measured as shown in Table 2 (in μ). Features of epimera and the genital plates as shown in Fig. 4 b. Genital plate horseshoe-shaped and the number of acetabulae on the plate in several specimens as shown in Table 3. Antero-ventral shield 130 μ in length and 210 μ in width. Genital plate horseshoe-shaped. Legs as shown in Fig. 5 a–d. Fifth segments of legs II–IV each with a prominent feathered spine on each distal end. Length of the legs measured in μ : L–I, 210; L–II, 220; L–III, 255; L–IV, 264.

Table 2

| Palpal segments | I | II | III | IV |
|------------------|----|----|-----|----|
| Extensor surface | 12 | 57 | 24 | 33 |
| Height | 36 | 42 | 21 | 12 |

Table 3

| Prep. nos. | 1770 | 1771 | 1772 | 1773 | 1774 | 1780 |
|------------|------|------|------|------|------|------|
| Right side | 5 | 4 | 5 | 5 | 5 | 5 |
| Left side | 7 | 4 | 5 | 4 | 6 | 6 |

Male. Body shape and organs almost same as those of the female. Anterior margin of genital plate shorter than that of the female and curved anteriorly a little. Penis skeleton occupied with four characteristic hook-shaped claws. Number of acetabulae on genital plates in several specimens as shown in Table 4.

Table 4

| Prep. nos. | 1775 | 1777 | 1778 |
|------------|------|------|------|
| Right side | 5 | 4 | 4 |
| Left side | 4 | 4 | 5 |

Nymphs. Body shape and organs closely resemble those of the adults. Deutonymphs having six-segmented legs I–IV and genital plate with three pair of fine hairs

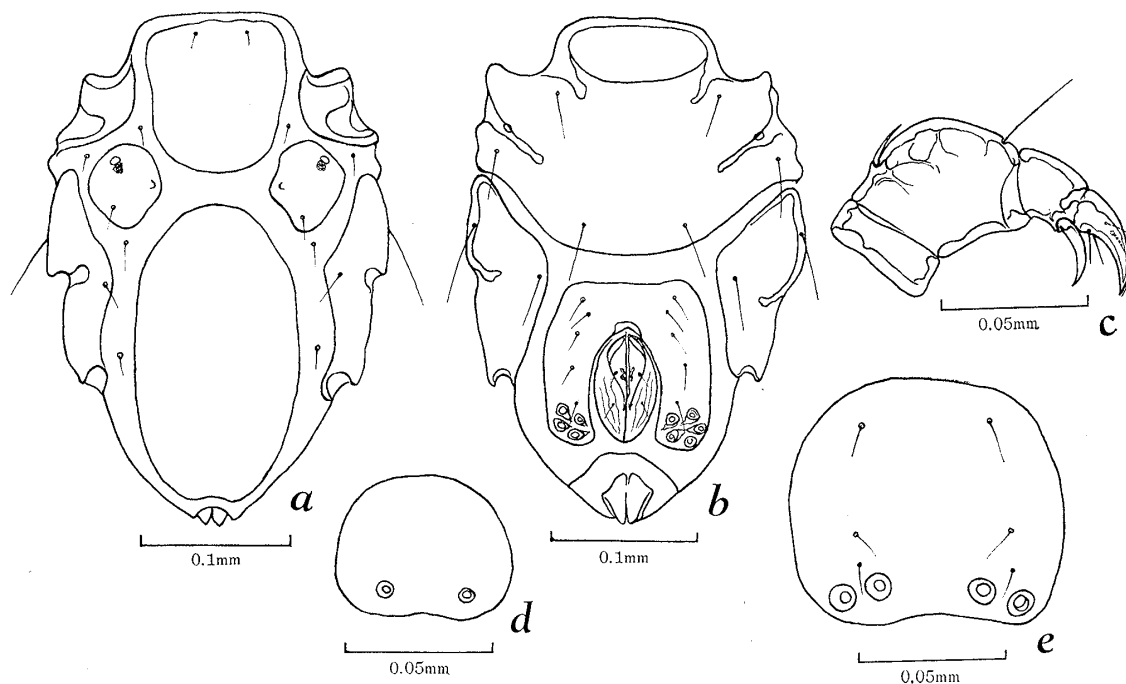


Fig. 4. *Soldanellonyx monardi monardi* WALTER. — a, Dorsum, female; b, venter, female; c, left palp, female; d, genital plate, protonymph; e, genital plate, deutonymph.

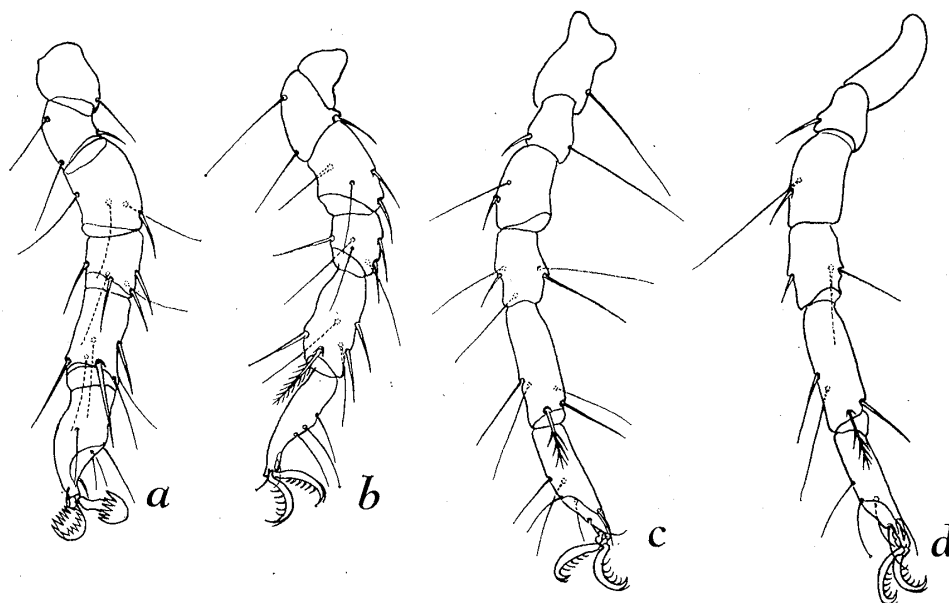


Fig. 5. *Soldanellonyx monardi monardi* WALTER, female; a-d, I-IV legs.

and two pair of acetabulae as shown in Fig. 4 e. Protonymph having six-segmented legs I-III and five-segmented leg IV, and genital plate with only one pair of acetabulae and no hairs as shown in Fig. 4 d.

Localities. Five males, seven females, four deutonymphs and three protonymphs were captured by the author on Oct. 5, 1971 among submerged plant roots and dead leaves in the Waimea Stream (water temp. 25°C and pH 7.0) and two males, seven females, three deutonymphs and four protonymphs were also collected by the author on Oct. 29, 1971 among dead leaves in pools in the Moleka Stream, Tantalus Hill, Honolulu, together with the preceding subspecies *Lobohalacarus weberi weberi*.

Remarks. The present subspecies seems to be widely distributed in small streams, springs and pool waters in Europe, Africa, North America and Hawaii. *Soldanellonyx monardi monardi* reported by IMAMURA (1957), collected from a well in Hyôgo Prefecture, Japan, seems to be another subspecies as was pointed out by BARTSCH (1975) according to a closer re-examination. Thence, I wish to establish a new subspecies for it: *Soldanellonyx monardi hyogoensis* n. ssp. This Japanese subspecies seems to have evolved as a stygobiont and is slightly different from *S. monardi monardi* from Europe in the shape of genital plate and in lacking seta on each fifth segment of L-III and L-IV. *Soldanellonyx monardi japonicus* IMAMURA, 1971 collected in a cave pool at the foot of Mt. Fuji-san, Japan, is distinguished from the present subspecies by the shape of palps and the absence of eyes. The palps of *S. monardi japonicus* are relatively short, especially in their second and third segments, than those of the present subspecies.

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